

ATTACHMENT P.

APPENDIX 2

GROUNDWATER MONITORING PLAN

OSCEOLA AND MECOSTA COUNTY, MICHIGAN

**THE UNITED STATES POTASH PROJECT
APRIL 2015**

GROUNDWATER MONITORING PLAN
OSCEOLA AND MECOSTA COUNTY, MICHIGAN



THE UNITED STATES POTASH PROJECT
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The U.S. Potash Project, Groundwater Management Plan

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**GROUNDWATER MONITORING PLAN
CLASS III AREA INJECTION LOCATION
OSCEOLA COUNTY, MICHIGAN**

July 21st, 2014

1.0 INTRODUCTION

Michigan Potash Operating, LLC is applying for a Class III area permit from the the Environmental Permitting Agency, Region V for the disposal of salt water located in Osceola County, Michigan (see Appendix A, Figure 1). A groundwater management plan is not necessary for Class III permit application purposes, however, is submitted here as a proactive measure and shall be followed carefully.

There are four proposed facilities, each of which the following Ground Water Monitoring Plan (GWMP) is applicable on a pre-built basis. Construction of the facilities is not yet underway.

The GWMP will be adjusted following as built drawings.

The facilities are geographically located in the Hersey and Ewart Township, Osceola County, Michigan.

The identified groundwater flow will be site specific and determined according to applicable ground and peisometric contours.

The water injection system consists of eight (8) cast iron, internally resin coated tanks; six are 21,000 gallons in capacity and two are 31,500 gallons in capacity and for water storage tanks, respectively. All tanks and equipment are connected by Schedule 80 non-coated piping. All pumps and mechanical equipment onsite are powered by electricity.

2.0 FACILITY DESCRIPTION

The general facility layout is shown on Figure 1 below.

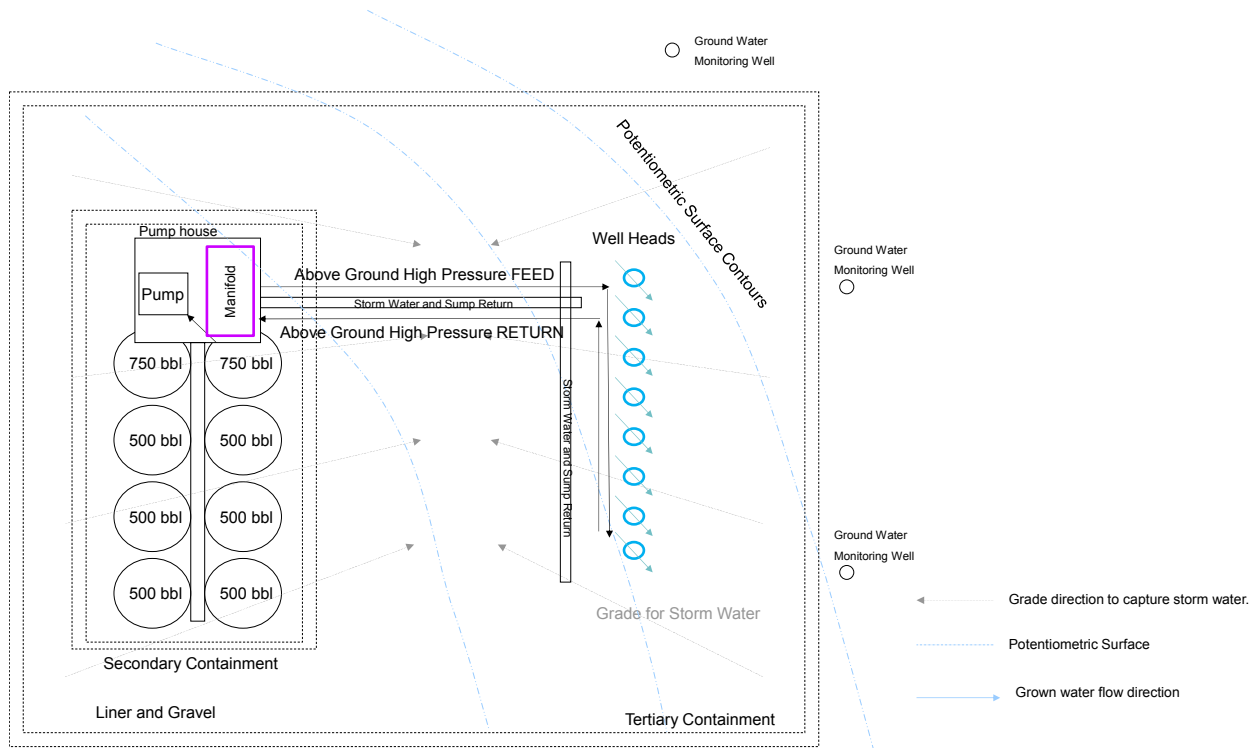


Figure 1 is an illustration of the proposed to build injection location(s).

Each injection well pad will contain a facility such as this. The facility receives, stores, and holds fresh water or salt water containing only sodium chloride and potassium chloride. The facility is non-commercial and receives only salt water from Michigan Potash Operating, LLC and/or its affiliates and can not, and will not accept fluids from any other source.

The Well facility is to be built and maintained in accordance with County, State, and Federal requirements.

The location will occupy no more than 5 acres more or less. The injection facility has holding capacity for water. The fresh water source well may be utilized to dilute salt water. The entire location is graded inward, over appropriate liners/gravel/cement for the purpose of storm water catch, and/or spill mitigation and containment. Tertiary containment is included.

Ground water monitoring wells are intentionally placed outside of the tertiary containment and shall be monitored and sampled according to the recommended sampling frequency as per the ground water monitoring plan as designed and implemented.

All lines will be above ground, insulated, and heat traced. There shall be no underground lines.

2.1 Process Description

Water, whether salty or fresh, will arrive at the facility and enter one 21,000 gallon above ground storage tank, with the ability to equalize across all storage volumes. The full storage volume of the injection facility is to enable adaptability of fluid handling processes with geological injection capacity. The proposed facility volume may be in substantial excess of what is actually utilized and needed provided adequate injection potential.

The tanks will vent through two lines with 4 oz vent stacks on two vent points. Water processed through the system will have the same properties as the water in the storage tanks.

The manifold shown in Figure K1 takes fluid from the holding tanks as shown, and feeds it to an injection wellhead. All tanks are internally resin coated carbon steel, some with external insulation. The 500 bbl tanks are 24H x 12W. The 750 bbl tanks measure 24H x 15.6W. The total capacity on location is 3500 bbls or 147,000 gallons. Secondary containment is designed accordingly. Tertiary containment is around the full facility.

Accumulated sediment, if any, will be cleaned out and removed from tanks on an as-needed basis. Pre-injection filtration will be removed on an as-needed basis.

The facility anticipates operating from 24 hours each day, 365 days a year.

2.2 Tank and Processing Inventory

The facility is designed to have multiple tanks for the purpose of operational flexibility provided injection pressure and volumes. All tanks are expected to hold similar fluid, i.e. simple salt water brine or fresh water.

A concrete containment basin. Offices and ancillary buildings will be situated outside of the containment areas.

The table below provides an inventory of process areas and tanks.

No. of Tanks	Size (Gallons)	Content/Process
6	21,000	Water Storage
2	31,500	Water Storage

2.3 Secondary Containment

The preliminary design for secondary containment under the unloading area will include concrete underlain by one or more layers of geomembrane for vertical containment. The tank and process area will be underlain by concrete for secondary containment.

A Spill Prevention Control and Countermeasures (SPCC) Plan is currently being prepared to help manage potential spills and releases from the facility. The SPCC Plan will include regular facility inspection procedures to aid in discovery, assessment, and cleanup of a spill, if one occurs. In addition, the SPCC Plan will include preventative measures to help reduce the potential of spill occurring.

3.0 GROUNDWATER MONITORING WELL INSTALLATION

Proposed locations for installing groundwater monitoring wells at the site are shown on Figure 1, whereby, all groundwater monitoring locations will be installed downgradient of groundwater flow, as verified during drilling, construction, and peisometric measurements. Well locations are proposed based on the estimated regional topographic conditions and major surface water locations.

3.1 Preparation for Drilling

At least 72 hours prior to drilling, Michigan Potash Operating will contact the local utility marking service to clear proposed drilling locations. Also at least 72 hours prior to drilling, Michigan Potash Operating will submit groundwater monitoring well permit applications to the Michigan Department of Environmental Quality, Groundwater Division. Courtesy Notice will also be given to EPA Region V, UIC, Class III, if requested.

3.2 Drilling and Well Installation

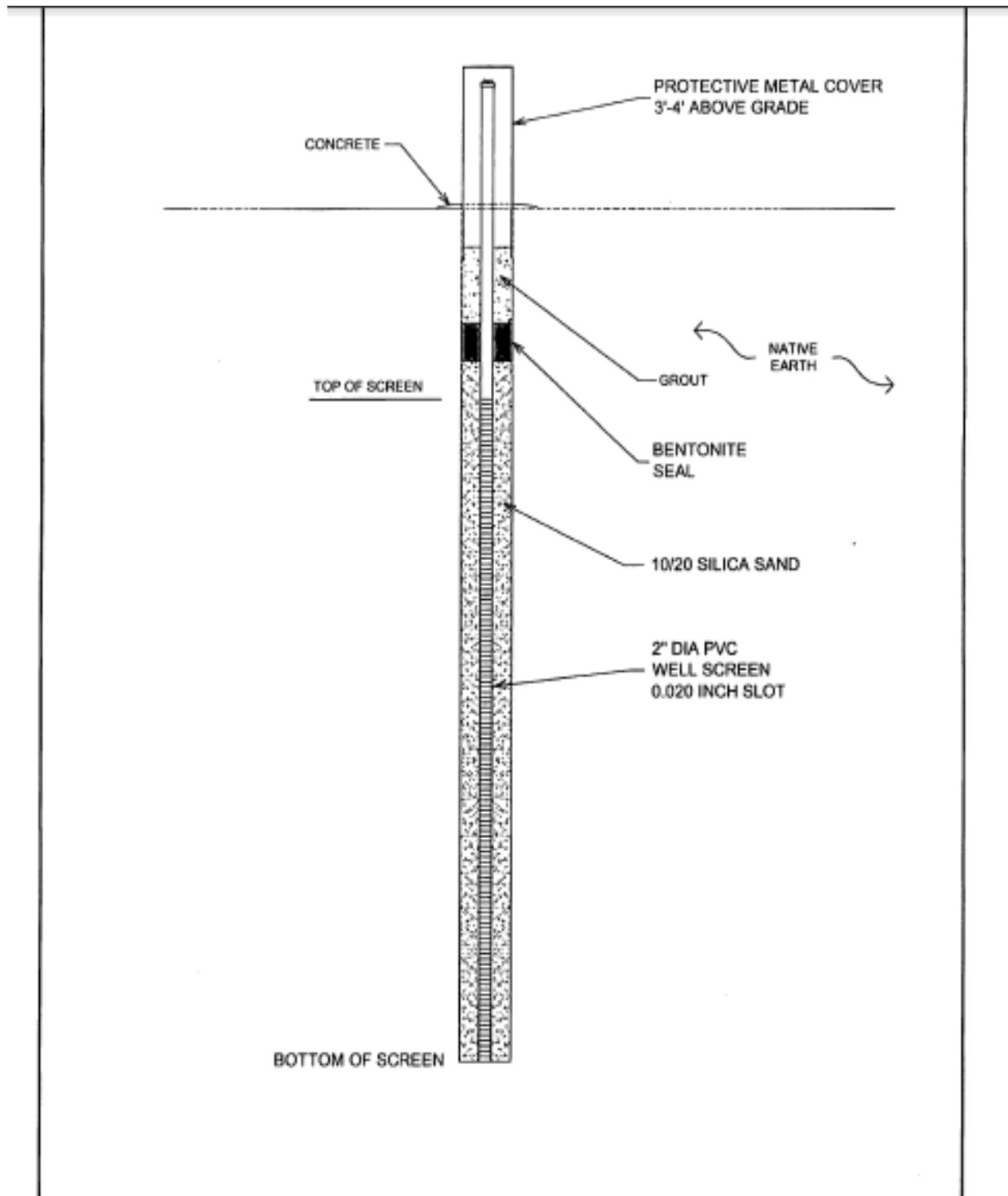
Monitoring well installation will be performed in general accordance with applicable rules and regulations described in Michigan Department of Environmental Quality, Groundwater Division well installation rules and regulations section of the Michigan Water Well Construction and Pump Installation Code (Part 127, Act 368, PA 1978 and Administrative Rules, Filed with the Secretary of State on April 5, 1994), and as modified via Well Construction Code Revision 2013.

For each well, Michigan Potash Operating will use a hollow-stem auger to advance a soil boring to the shallow groundwater table or a maximum depth of 50 feet bgs. Soil samples will be collected from the boring using a split spoon sampler at approximate five-foot intervals to the top of the saturated zone. Lithology of subsurface soils observed during drilling will be logged in the field. Soil samples will be screened in the field for evidence of contamination by visual and olfactory examination and by measurement of volatile headspace using a photoionization device (PID).

Each soil boring will be completed as a permanent 2-inch groundwater monitoring well as follows:

- Installation of 10 or more feet of 2-inch diameter 0.010-inch machine slotted PVC well screen with a threaded bottom cap;
- Installation of 2-inch diameter threaded, flush-joint PVC riser pipe to approximately 3 to 4 feet above the surface;
- Addition of pre-sieved 20/40 grade silica sand for annular sand pack around the well screen from the bottom of the boring to approximately 2 feet above the top of the well screen;
- Placement of 2 feet of hydrated bentonite pellets above the sand pack;
- Addition of cement/bentonite slurry to the surface; and,
- Installation of a flush mount or metal stick-up casing. Locking caps will be installed upon each well.

A typical groundwater monitoring well completion diagram is included as Figure 2 below.



Michigan Potash Operating personnel will return 2 to 3 days after installation to develop the wells using a surge block device and disposable bailing device. Wells will be developed by

removing approximately five well volumes of groundwater. Well elevations will be measured relative to an arbitrary datum using a rod and level.

Drilling equipment used will be cleaned using a high-pressure washer prior to beginning the project and before beginning each boring. Non-dedicated sampling equipment will be cleaned using an Alconox® detergent wash and potable water rinse prior to commencement of the project and between collections of each sample. Soil cuttings will be scattered unless there is field evidence of contamination, in which case the cuttings will be containerized onsite. Purge and development water will be containerized onsite.

4.0 GROUNDWATER MONITORING

Quarterly groundwater monitoring will be conducted.

4.1 Sampling Method

During each round of sampling, depths to groundwater will be measured. A minimum of three well volumes will be purged from each well using a disposable bailing device, and in situ temperature, pH, and conductivity will be measured and recorded during the purge process. Following purging, a groundwater sample will be collected using a disposable bailing device and will be placed in laboratory-supplied, pre-cleaned sample containers.

Samples will be preserved in a cooler on ice. Following completion of sampling, the samples will be submitted to a qualified analytical laboratory under chain of custody protocol.

4.2 Laboratory Analysis

For groundwater monitoring purposes, groundwater samples from the site will be analyzed for the parameters listed below. These parameters and the associated laboratory methods are shown below.

PARAMETER	ANALYTICAL METHOD	SAMPLING FREQUENCY
Total Dissolved Solids (TDS)	EPA Method 160.1	Quarterly
Chloride	EPA Method 300.0	Quarterly
Sulfate	EPA Method 300.0	Quarterly
Chloride	USEPA 120.1	Quarterly
Conductivity @ 25 C	USEPA 120.1	Quarterly
pH	USEPA 150.1	Quarterly
Specific Gravity	ASTM D 1429-79	Quarterly
Sulfate	USEPA 375.4	Quarterly
Sulfide	USEPA 376.1	Quarterly
Carbon, Total Organic	USEPA 415.1	Quarterly

4.3 Statistical Analysis

Groundwater analytical results will be evaluated statistically. A descriptive statistical analysis (number of data points, number of non-detectable data points, mean, maximum, minimum, standard deviation, and description of outliers) will be performed for each sample set. The trend analyses will be performed using the Mann-Kendall test and Sen's slope estimator. Using the Mann-Kendall test, a trend is significant at a 95% confidence level (two-tailed) if the absolute value of the Mann-Kendall statistic is greater than or equal to the absolute value of the critical value. A minimum of 7 rounds of data will be required to assess the accurately the analysis trends.

If a statistically significant increase in concentrations of one or more target analytes is observed, the release reporting procedures discussed in Section 5.0 will be followed.

4.4 Reporting

A summary groundwater monitoring report will be prepared and issued within 60 days of each sampling event. The report will provide a summary of sampling activities, tables with groundwater elevations and laboratory results, and figures

including a groundwater piezometric map. MDEQ Groundwater Division will be provided with a copy of each quarterly report within 60 days of the sampling

5.0 RELEASE RESPONSE ACTIONS

If groundwater monitoring and assessment indicates a potential release from the facility, Michigan Potash Operating will notify Osceola County, State and Federal Regulatory agencies within 24 hours of completing the statistical analysis of final laboratory analytical results and a written notice provided within 5 days.